REMARKS

As a preliminary matter, the undersigned representative would like to thank Examiner Zheng for holding a personal interview on 5 October 2006. During the interview, claims 31, 39 and 47, and U.S. Patent No. 6,001,235 issued to Arken et al. ("Arken") were discussed. The applicants respectfully request that this paper also constitute the applicants' Interview Summary.

Claims 31-48, 51, 52 are presently pending in the application. Claims 31, 39 and 47 have been amended in accordance with the discussion during the 5 October interview. The status of the claims in light of the Office Action dated 17 August 2006 is as follows:

(A) claims 31-35 and 37-48 were rejected under 35 U.S.C. § 102(e) over Arken;

(B) claim 36 was rejected under 35 U.S.C. § 103 over a combination of Arken and U.S. Patent No. 4,466,864 issued to Bacon et al. ("Bacon"); and

(C) claims 35-48 were rejected under 35 U.S.C. § 103 over the combination of Bacon, U.S. Patent No. 3,963,588 issued to Glenn ("Glenn"), and U.S. Patent No. 5,472,592 issued to Lowery ("Lowery").

A. Response to Section 102(e) Rejection—Arken

Claims 31-35 and 37-48 were rejected under 35 U.S.C. § 102(e) over Arken. In rejecting these claims, Arken is cited for the proposition that it teaches a flow control structure above the electrode support and below the microelectronic workpiece processing surface that includes a liquid pervious portion and a liquid impervious portion disposed annularly outwardly from the liquid pervious portion. For the reasons explained below, amended claims 31, 39 and 47 are patentable over Arken under 35 U.S.C. §§ 102 and 103.

Claim 31 is directed toward an apparatus for processing microelectronic workpieces. The apparatus comprises a vessel, an electrode support in the vessel, an electrode at the electrode support, and a flow control structure above the electrode support. The flow control structure includes a liquid pervious portion, a liquid impervious portion disposed annularly outwardly from the liquid pervious portion, and a plurality of fluid passageways in the liquid pervious portion. The fluid passageways have a uniform size and spacing in the liquid pervious portion, and the fluid passageways are configured to reduce turbulence in the processing solution. Support for the fluid passageways is found in Fig. 42 and in the text at, for example, page 84, line 23, to page 85, line 5. Referring to Fig. 42, one embodiment of the flow control structure is a diffuser plate 375 in which the fluid passageways have a uniform size and are spaced apart from one another by a uniform distance. The fluid passageways are also described as reducing turbulence in the processing solution. Therefore, the amended portion of claim 31 is fully supported by the originally filed specification.

Arken is directed toward a rotary plater having a plating solution distribution device located between an anode and a cathode. Arken teaches that a problem with electroplating is that the plating solution "moves across the plating surface at a velocity that increases with distance from the vertical axis of the plater." (2:4-6.) To counteract this problem, Arken teaches that the plating solution distribution device "distributes the plating solution over the plating surface at a distribution rate that increases with the radial distance from the central axis." (2:42-45.) One such distribution device is a circular plate 202 having tapered openings 208 that increase in size along a radial that extends from the vertical axis toward the outer periphery of the plate. (Figure 5 and 5:65-6:6.) The tapered openings 208 in Arken, therefore, are non-uniform so that they provide a greater volume of plating solution at the periphery of the wafer than at the center of the wafer.

Claim 31 is patentable over Arken under § 102 because Arken fails to disclose or suggest at least one feature of this claim. For example, Arken fails to disclose or suggest a flow control structure having a plurality of fluid passageways that have a uniform size and

spacing. The tapered openings in Arken, moreover, teach away from fluid passageways that have a uniform size and spacing because Arken requires a distribution device that distributes more plating solution to the periphery than the center of the wafer. Therefore, claim 31 is patentable over Arken under §§ 102 and 103.

Claims 32-35, 37 and 38 depend from claim 1. Therefore, these dependent claims are patentable over Arken for the reasons explained above, and also because of the additional features set forth in the dependent claims.

Claims 39 and 47 are also directed toward apparatus that include flow control structures with a plurality of fluid passageways that have a uniform size and spacing. Therefore, claims 39 and 47 are patentable over Arken under §§ 102 and 103 at least for the reasons explained above with respect to claim 1. Additionally, dependent claims 40-46, 48, 51 and 52 are patentable as depending from a patentable independent claim, and also because of the additional features set forth in these dependent claims. Therefore, the applicant respectfully requests withdrawal of the rejection of claims 31-35 and 37-48 over Arken.

B. Response to Section 103 Rejection—Arken and Bacon

Claim 36 was rejected under 35 U.S.C. § 103 over the combination of Arken and Bacon. Arken is cited for the proposition explained above with respect to claim 31, and Bacon is cited for the proposition that it teaches an anode on a diffuser plate. Without conceding to the characterization of Bacon, the disclosure in Bacon is irrelevant because it fails to overcome the teaching that modifying Arken to have a flow control structure with fluid passageways that have a uniform size and spacing would destroy the purpose of having the tapered openings in Arken's flow distributor. The combination of Arken and Bacon, therefore, does not disclose or suggest all the features set forth in claim 36. The applicants accordingly request withdrawal of the rejection of claim 36 over the combination of Arken and Bacon.

C. Response to Section 103 Rejection—Bacon, Glenn and Lowery

Claims 35-48 were rejected under 35 U.S.C. § 103 over the combination of Bacon, Glenn and Lowery. Bacon is cited for the proposition that it teaches everything except for the claimed flow control structure between the electrode and the workpiece processing surface, and the head assembly having a plurality of electrical contacts arranged to contact the periphery of a workpiece. Glenn is cited for the proposition that it teaches an anode cell having a diffuser plate 3 (Figure 1).

Independent claims 31, 39 and 47 are patentable over the combination of Bacon, Glenn and Lowery because this combination of references fails to disclose or suggest several features of these claims. For example, this combination of references fails to disclose or suggest a flow control structure with fluid passageways having a uniform size and shape to reduce turbulence in the processing solution. Bacon does not disclose or suggest the claimed flow control system as noted by the Examiner, and Glenn teaches a system having an anode housing with closely spaced ports 2 that form "coalescent jets 4." (2:31-35.) The purpose of Glenn is to "provide a method and apparatus for achieving uniform or preferential plating of recessed configurations." Glenn achieves this purpose by "forcing the electrolyte through a multiplicity of nozzle ports to cause the electrolyte to issue in a form of jets." (2:9-11.) The devise in Glenn, therefore, does not have fluid passageways configured to reduce the turbulence in the processing solution, but rather Glenn teaches a device that "utilizes a principal of electrolyte agitation" to achieve a different objective. (2:4-7) Therefore, the combination of Bacon and Glenn teaches away from the flow control structure set forth in claims 35, 39 and 47. The applicants accordingly request withdrawal of the rejection of claims 31-38 under § 103 over the combination of Bacon, Glenn and Lowery.

In light of the foregoing, the pending claims comply with 35 U.S.C. § 112 and are patentable over the art of record. The applicants accordingly request reconsideration of the application and respectfully submit that the pending claims are in condition for

allowance. If the Examiner has any questions or believes a teleconference would expedite prosecution of this application, she is encouraged to contact the undersigned at (206) 359-3258.

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Respectfully submitted,

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